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The quality of port services – an important factor in port competition

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Abstract. Considering that transport on water is used in very high proportion in international trade, the port industry is particularly important for economies of countries with coastlines. The role of ports for the national or even regional economies forces the stakeholders involved in port administration to manage the activities and services offered by ports carefully. An important aspect of the port industry that can be observed or even measured is the quality offered to customers. Customer perception regarding the quality of port infrastructures is an indicator measured annually by the World Economic Forum. By considering the processes in a port, this paper studies the components of quality, the role played by automation, digitization in the evolution of port services quality and how customer perception can ensure port competitiveness.

Keywords: quality, competition, port, shipping

1. Introduction

In the context of globalization, the port industry has grown in its role in the local or national economy. In particular, globalization has led to the widening of the importance of the private sector in port activity, and more multinational companies are showing interest in the port industry or its activities. Port competition in terms of pull-in ships, whether liner or tramp shipping, determines the commercial role of ports, and these contrasting shipping methods show a competition between ports for attracting private sector investment.

Investments generated by the private sector can help the economic development of the region and increase port market share. The port is a business ecosystem [1]; consequently, all ports want global investors who can attract major shipping companies.

The existence of a business ecosystem means that the stakeholders from the port community are closely collaborating, leading to port development.

A port that has managed to attract multinational companies must force the port authority to rethink its way of doing business. It is well-known that these reorganizations increase the competitiveness of the port in the region.

Thus, for the ports at the beginning or in the process of upgrading, the development strategy of the port can be focused on attracting investment from multinational companies with a significant market share.

However, how developed ports that are in fierce competition in terms of customers and items such as infrastructure or upgrading port equipment should be managed cannot be distinguished.

Solving this issue requires managing the port, promoting the port and highlighting the success factors of the port. Attracting multinational companies that introduce automation, digitization and IT solutions assimilated to port services may bring new customers, resulting in increased port traffic volumes.

However, once private companies arrive, things are not simplified for port administrators. Companies focus on the quality of the services offered in the port activities, and because port activity is not limited to the port territory, the quality of products and services is pursued in the hinterland area.

The quality of services is highlighted by the difference between the perception of the consumer and the expectation of using the service. [2]

The port transformation influences port management and forces port management to adopt new policies and strategies for development.

2. The quality of port services

2.1 *Quality components of port activity*

The quality components are generally valid regardless of the sector of activity. Any differences may occur due to the specific nature of the activity performed. Starting from the standardised definitions of quality, the general components are security, availability, condition, attitude, consistency and training. The implementation of all these components in an organization leads to the existence of a TQM system.

The security component has the goal of obtaining services or products that provide safe end-use to the client.

Availability ensures the final customer that products perform their tasks throughout their lifetime, i.e. they are reliable products.

When referring to a service or a qualitative product, certain conditions are imposed by the customer, and clauses also ensure the competitiveness of the product or service offered.

Quality development requires a reorganization of priorities and the adoption of specific attitudes leading to overcome the expectations of the client. This change of attitude occurs with the implementation of quality culture and determines an easier integration of the service provided on customer requirements.

Behavioral consistency in the quality implementation process must be maintained to ensure outcome uniformity that meets the requirements of the final customer.

The training process also develops human resource qualification according to the quality management requirements. Developing specific tools ensures the successful implementation of a quality culture within the organization.

Port industry has its own specific activities such as ship loading/unloading, warehousing, shipbuilding and other services for goods, ships or crews.

Considering these peculiarities of the port industry, the quality culture in port activity is associated with the following elements: safety, security, infrastructure, efficiency in port services, environment and customer satisfaction.

Tabel 1. Quality of transport infrastructure [3]

	Port	Road	Railroad
South America			
Argentina	3.7	3.3	2.1
Brazil	3.1	3.1	2.0
North America			
USA	5.8	5.7	5.5

Africa			
United Arab Emirates	6.2	6.4	-
Morocco	5.0	4.5	3.9
Egypt	4.7	3.9	3.3
Yemen	2.6	2.3	-
Australia			
Australia	4.9	4.8	4.1
UE			
Albania	3.4	3.5	3.4
Austria	3.9	6.0	5.3
Belgia	6.1	4.5	4.8
Bulgaria	4.1	3.4	3.0
Croatia	4.6	5.5	2.8
Cyprus	4.6	5.1	-
Denmark	5.7	5.5	4.6
France	5.1	6.0	5.8
Germany	5.5	5.5	5.5
Greece	4.5	4.5	2.8
Italy	4.4	4.5	4.1
Moldova	2.4	2.5	2.7
Netherlands	6.8	6.1	5.8
Norway	5.5	4.3	4.0
Poland	4.2	4.1	3.6
Romania	3.5	2.7	2.6
Russia	4.2	2.9	4.5
Spain	5.5	5.5	5.5
Turkey	4.5	5.0	3.0
Ukraine	3.5	2.4	3.9
UK	5.5	5.1	4.7
Asia			
China	4.6	4.6	4.8
Hong Kong	6.5	6.2	6.3
India	4.6	4.3	4.4
Japan	5.3	6.1	6.6
Singapore	6.7	6.3	5.9
AVERAGE	3.73	3.38	4.07

Customer perception of the quality of transport infrastructure is an indicator measured annually by the World Economic Forum. In addition, the quality of port infrastructure can be a defining element in terms of competition between ports.

The information provided annually by the World Economic Forum were grouped by continent, and the report analysed a number of 137 countries.

The results show that the countries that hold the top ports in terms of traffic volume also rank first in port infrastructure quality (Netherlands, Singapore and Hong Kong).

China and Greece, very important states in maritime transport, surprisingly had scores of 4.6 and 4.5, respectively, while the Netherlands had a score of 6.8.

Since the port of Greece, Piraeus, was "bought" by the Chinese, the future position of China in this ranking will be much higher in the next years.

China is a country with many ports (34 major ports and over 2000 minor ports); therefore, its average in terms of port infrastructure quality is lower. If the study only considered Chinese ports in the top 10 in terms of freight traffic, China's position was somewhere in the top three.

Regarding the Black Sea region, Romania's position is surprising, as well as Ukraine's, at one point less towards Turkey's position.

Romania with its three seaports has a lower score than the average ranked of 92, denoting the less developed infrastructure existing in seaports. Unfortunately, Romania is not positioned well for road or rail infrastructure quality, and the scores recorded are much lower than average.

The quality standards generally applied within the port industry are ISO 9001:2015 (quality management) or specific by industry such as ISO 14001:2004 (environmental management) or eco-management and audit scheme (EMAS), and occupational health and safety management (OHSAS) 18001:1999. A quality measurement instrument used in the port industry is SERVQUAL, which, through the customer's response to the questionnaire, analyzes five dimensions: empathy, assurance, reliability, responsiveness and tangibles.

In the ports of 90's, elements such as security, safety and environment have not been considered. As the freight volume increased and the operating technologies have been upgraded, the evolution of the ships and the pressure of the port community have led to a deepening of the issues of security, safety and environmental awareness.

The industry has become very competitive, and the port has not dissociated from this global trend. In addition, quality is a factor with an important role in terms of increasing the competitiveness in port activity.

The imposition of quality culture comes because of increased competition in certain shipping markets, such as cruises, containers and cereals. Once traffic for these categories of cargo increased, the port had to improve the quality to meet customer requirements.

2.2 Future challenges

Recently, the naval industry is implementing new IT solutions that make it easier to perform port activities. With accelerated automation and digitization in shipping, measuring the quality of customer service has become easier.

The technological solutions in ports are new elements that may lead to competitive differentiation in a fierce battle for supremacy.

Rotterdam and Singapore, ranked first in the world and Europe, respectively, are not at the beginning of digital transformation. Both are in a race of tracking and identifying new technological solutions that modernise their ports.

Thus, Rotterdam started with the automated container shipping system for the storage area by developing with Toyota and Scania an automated road transport system from the harbor area to the hinterland.

Also, for several years, Rotterdam has developed an online route planning system which, after upgrading, integrates the planning of port operations with the river, road and rail transport system. Thus, the charter can identify the best route to the final customer. In other words, the port of Rotterdam digitizes its logistics chain from the port to the hinterland.

Port of Singapore is developing technology to become a smart port, so it is updating to take advantage of automation and information technology implementation.

In ports in Romania, digitization is just beginning because the port is starting its involvement in regional maritime transport and logistics chains. If there is pressure from stakeholders to accelerate the flow of freight traffic, the implementation of new technological solutions in Romanian ports is at a higher level.

Ports may not have wanted this accelerated, but they had to keep up with the shipping companies.

Maersk Line has begun developing blockchain solutions to manage and monitor transport operations more easily. In turn, shipping companies have needed to adopt modern technological solutions with the deployment of technologies such as internet of things by their customers. Failing to adopt these technologies by shipping companies may cause the clients to turn to the competition.

All this transformation also implies some changes in quality management. Companies that certify the implementation of a quality management system, such as Bureau Veritas (BV), have needed to invest in these technologies. For example, BV has ongoing pilot projects for some logistics chains that have been digitised.

3. Conclusions

Identifying the elements of quality in the port industry helps stakeholders to include them in port development policies. Due to the particularities of each port, the way to deploy these quality components depends on the port and even on each port terminal.

Implementing a quality management system in a port is more complex than in the largest companies because of the diversity of services offered by every company in the port. Also, the port services are not limited to the port area and must be integrated with the supply chain of goods, complicating the quality system approach.

With the automation and digitization of activities from the harbor area to the hinterland area, customer requirements have diversified, and the correlation of quality processes with these changes is required to maintain competitiveness.

The absence of quality standards custom for the port industry has led to initiatives that have implemented quality processes personalised only for port activity.

The benefits of quality culture for the port industry are as follows:

- the performance of port services port can be correlated with customer satisfaction;
- stakeholders in a port can focus on the processes that need to be improved and are determinant in increasing service quality performance by starting with the activities considered important by the client;
- the port can guide companies on the logistics chain to improve services by considering the growth of IT solutions and blockchain solutions in port services.

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